بسم الله الرحمن الرحيم

عنوان المحاضرة: Benign Tumors
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Bone tumor:

Mass of cells resembling the normal tissue but haphazardly arranged with unuseful function

Classification of bone tumors:

A) According to behavior: Benign / Malignant
B) According cell of origin:

1- Osseous origin:

	Benign	Malignant
Osteoblast	Osteoma, osteoid osteoma, benign osteoblastoma	Osteosarcoma
Chondroblast	Chondroma, benign chondroblastoma, exostosis	Chondrosarcoma
Osteoclast	Osteoclastoma (Grading from benign to malignant)	
Fibroblast	Nonossifying Fibroma (metaphyseal fibrous defect)	Fibrosarcoma

2-Non osseous origin:

Deposits	Secondaries (e.g. Leukemia, Lymphoma)
Endothelial cells	Ewing's sarcoma
Fat cells	Lipoma, Liposarcoma

3-Bone secondaries: Metastasis
4-Remnant of notochord: Chordoma, Adamantinoma

Diagnosis:

a) Clinical:
1-Mass: DD→ 1-Callus formation 2-Inflammatory or infection 3-Dystrophic cyst (e.g. unicameral cyst)
4-Endocrinal: parathyroid osteodystrophy
2-Pain, tenderness
b) Lab: 1-Complete blood picture 2-Alkaline phosphatase 3-Acid phosphatase
4-Sedimentation rate 5-Leukocytic count and differential
c) Radiological:
1-Plain x-ray:
- Age of the patient
- Site of the lesion (epiphyseal / metaphyseal / diaphyseal)
- Localization of the lesion (central/eccentric)
- Character (Bone destruction/New bone formation)
- Behavior (benign / Malignant)

2-CT 3-MRI 4-Angiography
d) Biopsy: (excisional / incisional)

General lines of treatment:

-According to: (Surface x Endosteal - Benign x Malignant - Osseous x Non osseous)
1-Surface & Benign: Excision
2-Endosteal & Benign: Curettage & Graft
3-Endosteal & Malignant:
a- Osseous: Radio-resistant and resistant to cytotoxic drugs → Limb salvage procedure
b- Non-osseous: Radiosensitive
4-Bone secondaries: -Control of the primary -Relief the pain -Fixation of pathological fractures

Differences between benign & malignant bone tumors:

	Benign	Malignant
Age	Children, young adults (at any age)	▪Young → Ewing's ▪ > 40 → Chondrosarcoma ▪ > 60 → Secondaries
Shape	▪ Well-defined edge ▪Circumscribed ▪ Has a capsule ▪ Mold according to surroundings	▪ Ill-defined edge ▪Irregular ▪ May have a false capsule
Size	Small	Rapid growing, Bad prognosis before reaching the large size
Growth rate	Slow	Rapid invasion of surroundings
X-ray	▪ Well defined sclerotic margin ▪ -ve periosteal reaction ▪ No cortical distruction	▪ Ill-defined lesion ▪ Severe periosteal reaction ▪ Cortical distruction
Microscopy	▪ Well-differen.: copy parent tissue	▪ Ill-differen.: Low resembling to parent
Effect	Mild general symptoms Pathological# when ↑ in size	Mechanical pressure to surroundings Destructive tissue, Hge, pain, Cachexia Pathological #, Bone secondaries
Treatment	Surface: excision Endosteal: Curettage & grafting	Osseous: Surgical ttt Non-osseous: Radiosensitive

A) Osteoblast:

1-Osteoma:

- Proliferation of bone cells, in flat bones (skull), either outside (cosmetic) or inside (pressure on brain)
- Treatment: excision by multiple holes (not chiseling to avoid brain contusions)

2-Osteoid osteoma:

- Age: young -Site of the lesion: metaphyseal - Localization: Intra-cortical
- Clinically: tenderness, pain (↑at night, nagging, like tooth-ache, relieved by acetyl salicylic acid)

**Pain is due to pressure on medulla

- Radiology: Radiolucent area surrounded by massive sclerosis with small nidus (nucleus) of vascular granulation tissue aiming for reconstruction of the bone - Treatment: Curettage without graft

3-Benign osteoblastoma:

- Resembles osteoid osteoma but larger and filled with osteoid tissue - Pain is continuous day & night

B) Chondroblast:

1-Chondroma:

-Age: young -Site of the lesion: epiphyseal or metaphyseo-epiphyseal
-Symptomless and discovered accidentally during x-ray -Patient may have pathological #
-Radiology: Well defined radiolucent area
-Treatment: Enchondroma: curettage & graft - Ecchondroma: excision only

2-Osteochondroma "osteocartiligenous exostosis"

-Benign bony growths or projection covered with cartilaginous cap
-Solitary or multiple, sessile or pedunculated, hereditary or traumatic
-Age: Adolescence - young adult -Site: Metaphysis of long bones - Painless unless complicated
- Complications: 1- Compression of nearby structure 2- Locking knee joint
3- Adventious bursa under skin 4- Malignant transformation into chondrosarcoma
- Radiology: Well defined metaphyseal bony projection (Radiological size < actual size)
- Treatment: excision

Bone Cysts: (EXAM Q)

1-Unicameral bone cyst:

-Definition: unilocular (one chamber) benign bone lesion
-Age: children & adolescents -Site: metaphyseal -Localization: central
-C/P: Asymptomatic / Pathological fracture
-Radiology: oval central translucent area +normal bone in between it & epiphysis (Juxta-epiphyseal)
-Treatment: If pathological # occurs: -Curettage & Graft -Cement -Bone marrow injection

2) Aneurysmal bone cyst:

-Definition: benign tumor like non-pulsating lesion consists of blood filled spaces of variable size separated by C.T. septa
-Age: young -Site of the lesion: metaphyseal -Localization: eccentric
-Radiology: eccentric radiolucent area with trabeculation + Expansile (Ballooning)
-Treatment: curettage & grafting